

Earth-Friendly Gardening & Landscaping



Going Solar to Set Your Soil Straight

Everybody knows that sunlight makes plants grow. But did you know that solar energy can help you "grow" healthier soil? If not, welcome to the solar-powered world of soil solarization!

Solarization is a safe, non-chemical, and effective method for controlling the host of pests and diseases which might be lurking in your garden soil, including harmful bacteria, fungi, and nematodes, as well as insect eggs, root-gnawing larvae, and weed seeds.

Of course, most of your landscape gets along just fine without special intervention, but for vegetable gardeners and folks with specialized garden beds, such as dahlia collections or an annual cutting garden, going solar can help prevent problems, while enhancing any site's horticultural performance.

Solarization is a creative spin on the greenhouse effect, which uses simple plastic sheeting and the sun's radiant energy to help sanitize the top six to eight inches of garden soil. And although the process does require setting aside a garden area for about two months during the summer,

it is far safer and less expensive than using toxic soil pesticides or other fumigation methods.

Experienced gardeners know that they should rotate their vegetable crops each year and select disease-resistant varieties to control soil-borne diseases. However, this is not always a practical option for some gardeners with limited space, and after a while, any soil used and planted repeatedly with similar crops will be still be infested with damaging populations of the most persistent pathogens, like verticillium and fusarium wilt, as well as parasitic nematodes, along with

other weed and pest problems.

By using solarization to dramatically elevate soil temperatures up to 140 degrees for a period of weeks, you can essentially bake those problems away. Moreover, solarized soil is rapidly re-colonized by beneficial bacteria and fungi, such as those which help fix nitrogen in the soil, while yet other beneficial microorganisms will fill the void to help fight off pathogens in the future. In short, your soil will be healthier and better able to enhance plant growth and crop yields.

To begin, select a garden bed or planting area at least 30 to 36-



inches wide, which is normally the most practical width for planting. Smaller strips probably will not generate or retain enough heat to be effective.

Remove all visible vegetation and other plant debris, and then cultivate the soil to a depth of six inches or more. It is generally preferable to use a rototiller to break up any clumps and provide a smooth, friable medium. Keeping the texture of the soil smooth is essential to prevent the formation of air pockets which will interfere with heat generation and conduction. Also, carefully rake over the surface of the planting area to ensure that it is completely free of stones or other coarse materials which might tear or puncture the plastic sheeting.

During cultivation, be sure to add any desired organic amendments such as compost, or any fertilizer or lime, which might have been called for by a soil test. If you are planning to use soaker hoses or drip irrigation, you should put those elements in place now. Please note that after solarization, you do not want to till or disturb the soil, as that will only expose buried weed seeds. Finish by digging a trench approximately six to eight inches deep and wide around the perimeter of your garden bed.

Next, water the planting area thoroughly. Use a sprinkler or soaker hose system and let it soak the prepared soil for at least several hours, penetrating almost to a depth of one foot. Every square inch of soil must be moistened for adequate heat generation.

Afterwards, cover the area with a clear plastic sheet made from UV-stabilized or resistant polyethylene or PVC. Untreated plastic film will degrade in sunlight, and neither black nor opaque plastic will generate sufficient heat.

Selecting the proper thickness of plastic tarp is important. While very thin film (.5-1 mil) is less expensive, it tends to rip very easily, and would only be suitable for one use. Thicker plastic (4-6 mil) is tougher and lasts longer, but does not allow as much more sunlight to pass through. Instead, try to find a medium sheet (1-3 mils), and stretch the plastic tight and smooth across the planting surface.

In addition, for increased effectiveness, consider using a double-layer of plastic with an insulating air space between the layers. You can easily separate the two layers using empty aluminum cans. The extra layer can increase soil temperatures by another six degrees, while also retaining more heat on overcast days and at night.

After getting your plastic firmly in place and tucked down into your trench, backfill with soil to bury the ends of the sheet - and just wait for the sun to do the rest. If your solarized bed is in an especially windy location, you might want to place some bricks or rocks on top of the trenched area as an additional anchor.

For the most part, solarization should be undertaken anytime during the hottest, brightest months, from June through August. It can be done earlier or later, but additional time under wraps would be required, up to three months. Traditional summertime treatment requires four to six weeks, and as much as eight, if the skies were particularly cloudy, or if you have been plagued with stubborn, noxious weeds for years.

After solarizing, carefully remove and store the plastic for another use in a subsequent year. Your garden bed is now ready for planting. If you do not plan to plant for several months, with a cool weather crop, for example, be sure to cover the bed with a weed-free mulch.

Lastly, remember that solarization only eliminates or reduces pest organisms and weed seed from the top several inches of soil. Do not disturb your sanitized soil any more than is neces-



The GreenMan Show is produced for County Cable Montgomery by the Department of Environmental Protection (DEP) and the Office of Public Information. It airs daily on Cable Channel 6 and can also be

viewed on the Internet. For a complete schedule and online access, visit www.greenmanshow.com.

Joe Keyser is the author of the GreenMan column for the Gazette Newspapers in Maryland, and also host of The Greenman Show. A downloadable library of previous environmental articles, columns, and reviews are available online at greenman.askdep.com. Print copies are also available by contacting DEP at the following locations:

**Montgomery County
Department of
Environmental Protection**
255 Rockville Pike, Suite 120
Rockville, MD 20850
240.777.7770 fax 240.777.7765
email: help@askdep.com
www.askdep.com

